

ON THE IDENTITY

OF THE

VITAL AND COSMICAL PRINCIPLE

BY

ROBERT LEWINS, M.D.

STAFF SURGEON-MAJOR TO HER MAJESTY'S FORCES.



"Felix qui potuit rerum cognoscere causas
 Quique metus omnes et inexorabile fatum—
 Subjecit pedibus, strepitumque Acherontis avari."

VIRGIL.

"Know, then, thyself—Presume not God to scan;
 The proper study of Mankind is Man."

POPE'S ESSAY ON MAN.

"If it be possible to perfect mankind, the means of doing so will
 be found in the Medical Sciences."

DESCARTES.

Lewes:

GEORGE P. BACON, STEAM PRINTING OFFICES.

1869.



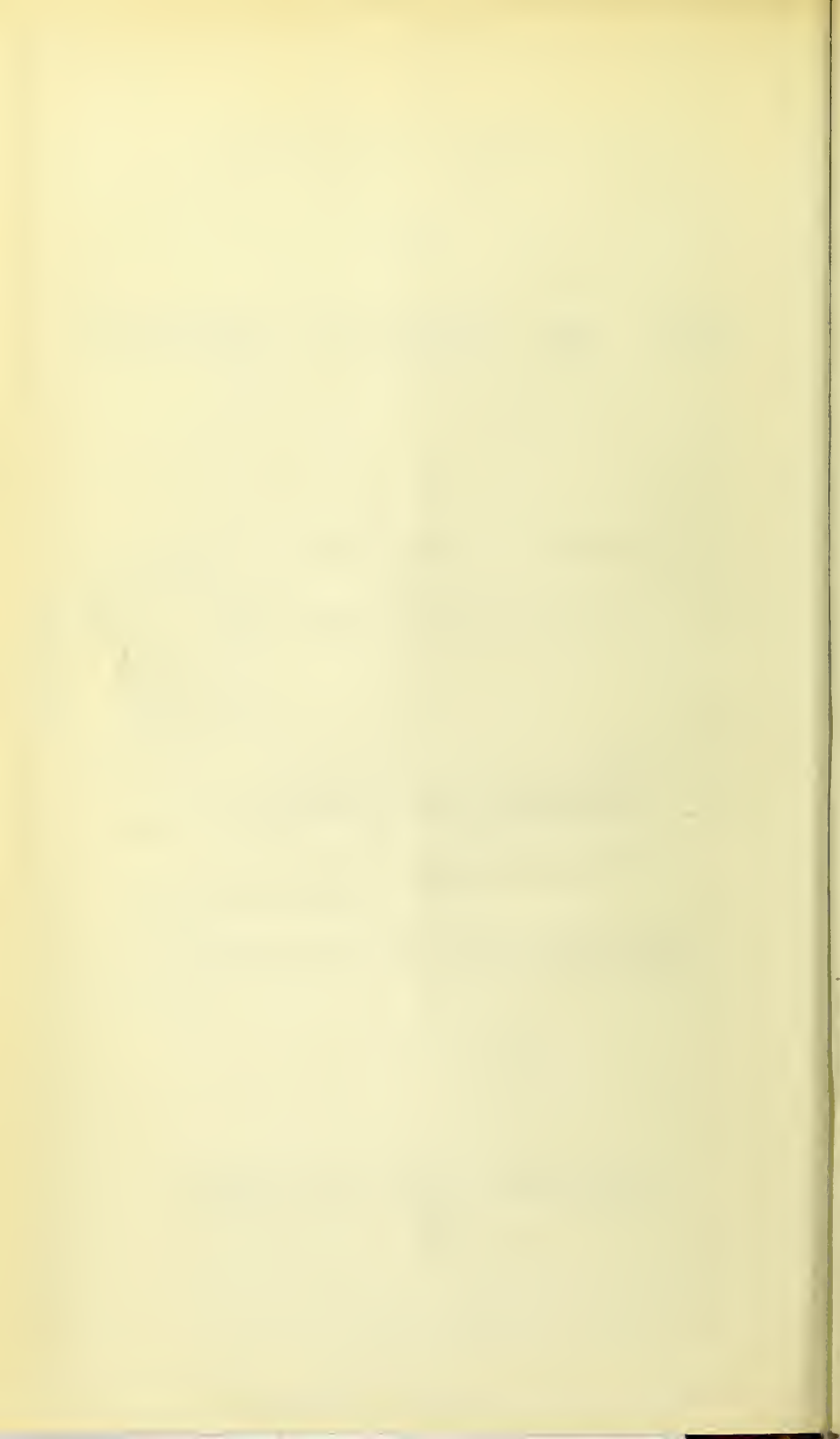
ON THE IDENTITY OF THE VITAL AND COSMICAL PRINCIPLE.

THE object of the following remarks, which are merely the corollaries from certain scientific facts expressed in intelligible formulas, is to state A RATIONAL THEORY OF HUMAN EXISTENCE, in which everything supernatural, or which contradicts the universal common sense of mankind, is relegated into the province of disordered ideation.

I may premise this formulation and exposition of fact by stating, that in all civilized ages and countries of which we have any record, the higher orders of intellect, or, to express it less pretentiously, the truly thinking part of the community, which always constitutes a very small minority (thought, in accordance with nature and fact, being a much more difficult process than belief or fancy) have always been dissenters from the authorised creed of the majority,—their dissent differing in degree from simple scepticism or doubt up to the most emphatic protest and denial, entailing upon the dissidents persecution in every shape up to death itself.

I may further premise, that all the chief theosophies of the world—Judaism, Christianity, Mahomedanism, &c., have had their origin in the East; the three dominant ones I have named in *one* part of the East, viz.,—Syria, in which the human mind is peculiarly prone to mysticism, by which term I mean such a preponderance of the idealising or imaginative over the really judicial faculties of the mind, that sober reason, the seeing everything as it really is in the open daylight of fact and nature, is quite overlaid by the illusions of fancy and ideality.

From a competent personal acquaintance with the East, which appears to have remained stationary from the dawn of human history till the present hour, I feel justified in stating, in full confidence that my statement, though it may be contradicted, cannot be refuted, that the Oriental intellect in all ages, is



ON THE IDENTITY OF THE VITAL AND COSMICAL PRINCIPLE.

THE object of the following remarks, which are merely the corollaries from certain scientific facts expressed in intelligible formulas, is to state A RATIONAL THEORY OF HUMAN EXISTENCE, in which everything supernatural, or which contradicts the universal common sense of mankind, is relegated into the province of disordered ideation.

I may premise this formulation and exposition of fact by stating, that in all civilized ages and countries of which we have any record, the higher orders of intellect, or, to express it less pretentiously, the truly thinking part of the community, which always constitutes a very small minority (thought, in accordance with nature and fact, being a much more difficult process than belief or fancy) have always been dissenters from the authorised creed of the majority,—their dissent differing in degree from simple scepticism or doubt up to the most emphatic protest and denial, entailing upon the dissidents persecution in every shape up to death itself.

I may further premise, that all the chief theosophies of the world—Judaism, Christianity, Mahomedanism, &c., have had their origin in the East; the three dominant ones I have named in *one* part of the East, viz.,—Syria, in which the human mind is peculiarly prone to mysticism, by which term I mean such a preponderance of the idealising or imaginative over the really judicial faculties of the mind, that sober reason, the seeing everything as it really is in the open daylight of fact and nature, is quite overlaid by the illusions of fancy and ideality.

From a competent personal acquaintance with the East, which appears to have remained stationary from the dawn of human history till the present hour, I feel justified in stating, in full confidence that my statement, though it may be contradicted, cannot be refuted, that the Oriental intellect in all ages, is

utterly incapable, from organic defect—from excess of the ideal or imaginative element over the causative ones—of true scientific analysis or verification. The thinking powers of an Oriental resemble those of a child, being quite deficient in the requisite patience necessary for long continued impersonal abstraction, in default of which it becomes the prey of every form of delusion, investing objects with the hues of its own personality, and incapable of seeing them as they are in absolute (objective) fact, or reality and truth.

As has been often said, till the idea is stale, the former ages of the world are ages of infancy; the primeval seats of such civilisation as existed, viz., Egypt, Syria, Mesopotamia, the Valley of the Ganges, &c., were its nurseries. It is only in these later days that man has attained anything like his adult stature, and only since then has he fallen upon the right method of employing his reason in the investigation of truth; what has been called “faith,” being merely fancy—always strongest in the childhood of individuals and the dark ages of nations, and disappearing, more or less, with progress and enlightenment—personal and national.

If this fact be so, if the maxim be a fact and not a fable, that the minds of men increase in strength and acquaintance with the actual and not merely fanciful and theoretical operations of nature in the course of ages, which necessarily bring with them improved methods of research and experience, have we not such an *a priori* argument for the superiority of the present age of demonstrated science over former ages of comparative speculation and nescience, as to amount to a moral certainty that our platform is higher than those of our predecessors, and that we are actually untrue to our legitimate privileges if we yield unenquiring obedience to their authority? The pretensions of theologians that the early ages of mankind were nearer the fountain of truth and knowledge than ourselves hardly merits examination, basking, as we do, in the light thrown upon palæontological problems by natural philosophy, by the sciences of astronomy, geology, and zoology.

I mention above that the few perfunctory remarks thrown together in the preceding few sentences amount to a *moral* certainty, that, where the understanding of the present age is at issue with the dogmatic assertions of earlier ages, the advantage is with the former. It is the special object of what follows to bring forward as *physical* certainties—demonstrable data—the results of researches in dynamical anatomy (animal

physiology) and the collateral sciences—chemistry and physics, which explain on other than supernatural principles—on principles consonant with right reason and the immutable order of creation's laws—all those phenomena in the domain of human sensation, which have been vulgarly and authoritatively ascribed to extra-mundane influences—that is, to influences which do not come into play in the ordinary providential government of the universe. The scope of my remarks is to make more evident than has yet been effected by metaphysicians, astronomers, chemists, physicists, or the modern school of zoology, from Buffon and Cuvier, to Darwin and Huxley, by arguments drawn from animal physiology and histology, the fact, that all miracle is impossible—impossible because unnecessary; the universe, viz., the whole material creation, sentient and non-sentient, organic and inorganic—having been originally constructed—if it be rational to speak of its having ever been constructed, it appearing to transcend the legitimate limits of the human imagination or power of calculation, to frame to itself, an idea of a period when, in some form or other, this material universe *was not*—by Divine Omnipotence on a plan perfect as He is perfect, and therefore capable of providing for all contingencies through time and through eternity, without any, even the smallest, rupture in its continuity. On the hypothesis of frequent solutions of continuity it is clear that it could not have been originally perfect, seeing its harmony is being frequently disturbed. Now, strange as it may at first appear, and yet it is not strange when the idea has become familiar to the mind, that the simplest things are always overlooked and are the last to be found out, the mind having a natural tendency to begin its activity far from home, and only slowly and gradually returning into itself, this postulate, viz., that supernaturalism has no real—only an ideal and illusory existence seems proved as soon as we realize to ourselves the idea which is the leading one in such sublime ontologies as those of Spinoza and Hegel, and which idea may be formulated in the following short sentence:

That one force or agent,—one source of causation or impersonal Vicar of the Great First Cause, is active both in thought and the objects of thought; or in other words, that external creation from the smallest molecule of matter in ourselves, or the objects around us up to planets and suns, is acted on or moved by the same medium as that which effects sensation and thought, by which we take cognizance of all operations in ourselves and other objects. In other words this proposition may be stated more

concisely in the formula: *Vital force (or action) and physical force (or action) are one and the same.*

German philosophy uses the term, "subjective," to express what is inward and *personal*; "objective," to express what is external to ourselves and *impersonal*. As stated by philosophy, this generalization is merely empirical—that is to say, it is an *opinion* merely, which is plausible only, and which philosophy can only ring the changes upon by different modes of illustration, without any means of submitting to the only test that is really satisfactory to the general sense of mankind at their present standing point of thought—viz., physical demonstration and scientific—in contradistinction to metaphysical—verification.

Some experiments to which I was led a good many years ago during the process of restoring my health, which had been seriously impaired by some hot seasons in a malarious district of central Hindostan, seem to supply this desideratum—viz., an incontrovertible evidence and proof that the Deity has been pleased to avail himself of *one* agent, and not of two, three or more in the causation of life and inanimate creation, and that the former results not from the introduction of any new element *special* to itself, but solely from a specific arrangement under more complicated conditions than those in which is no life, in a manner which appears incontestable. I find, namely, that when operating upon the chief nerve of breathing, which also is the only nerve in the whole body which is indispensable to life—for it is the only one which, if cut through or seriously injured, brings on immediate death, as by a lightning stroke—that its function can be increased by a hyper-oxygenated agent, and instantaneously suspended by a de-oxygenated one. Now, insignificant as this phenomenon may appear, it yet not only points to, but renders absolutely certain—with the same degree of certainty as the demonstrated Laws of Motion of Kepler, when completely developed, prove the revolution of the earth on its axis and in space; or any other phenomenon in the Principles of Natural Philosophy of Newton, or La Place, or the identity of electricity and lightning of Franklin—that nervous energy, which is the culmination of vital activity, is electrical and electricity, as shown by the doctrine of conservation or correlation of force, is only one of the forms in which the universal physical power of Nature shows itself; one with light, heat, and gravitation (attraction), into any one of which forces each, and all the others, are mutually convertible.

It may at first sight appear as if I were precipitate in reaching this conclusion of the identity of electrical and nervous force, from the apparently insignificant experiment on the vagus or pneumo-gastric nerve above mentioned ; but a very slight detailed explanation will, I imagine, do away with this misapprehension. By increasing the function of a nerve by bringing oxygen, otherwise called vital air, from its being the sole use of the first act of respiration, viz., inspiration to charge the blood with this gas, the blood without it (the venous blood) being not only useless but poisonous in the animal economy, and fishes, &c., requiring it just as much as animals that respire in the atmosphere, directly into contact with its peripheral extremities, and by suspending or paralysing its functions by bringing directly into contact, with its peripheral extremities, a substance that contains no oxygen, we elicit the fact from the structure of a nerve being such as renders it incapable of transmitting a gas, though quite capable of being the conductor of an imponderable "fluid" like electricity, that oxygen can exist not only as a gaseous but also as an imponderable body or agent, and therefore necessarily taking its place as one of the members of the group of physical forces, identical with electricity, with heat, and light, and attraction ; so that the same force is active in life as in all the operations of physical astronomy, ordinary mechanics, and in chemistry, the force being one that gives us power to feel and to think as that which moves the world, and performs as molecular force all the transmutations of chemical affinity and repulsion. To understand thoroughly the evidence on which is based the modern doctrine of correlationship of physical force—a scientific development which has grown up during the last twenty or twenty-two years, and which has quite revolutionised former ideas of the internal constitution of matter—it will be necessary to peruse carefully Tyndall's recent lectures on "Heat as a Mode of Motion," and on "Radiation," works published within the last few years, and characterised by all that lucidity of statement and exposition, and that wealth of experiments and illustration for which the Royal Institution of Great Britain has been so specially distinguished, since its formation in the early years of this century in the hands of Sir Humphry Davy, Michael Faraday, and Dr. Tyndall.

I ought to mention that as a speculation the idea of the identity of vital and electrical energy has long been familiar to scientific enquirers, both physical and medical. It was a favourite one of Herschell, Sir H. Davy, and many others ;

twenty years ago last April, Professor Faraday, himself—then in the meridian of his great philosophical intellect—stated to myself that he himself when at work in the Royal Institution on the *Gymnotus* (electrical eel), was coming to similar conclusions as myself, but was attacked by such tension of the brain and other alarming symptoms of congestion in the head, that he was compelled to discontinue, and declined to renew the enquiry. There is, indeed, in the English language a work on the Principles and Practice of Physic, by a man of high reputation, Dr. A. Billing, one of the examiners of London University, written on the supposition that the nerves act by electric agency, but I need not say that between a supposition and distinct proof (which latter alone makes a theory or belief practically certain and available) there is a wide distinction, *and it is only the fact of the constancy of oxygen and electricity that supplies the certainty of the oneness of this inorganic element and the vital principle.* I say designedly vital principle and not merely nerve force, because, though I reached the fact by means of experiments on the nervous system, still the moment we discover that oxygen gas is in another shape or condition of polarity, also electricity, heat, &c., that moment the whole question changes its entire aspect. Knowing, as we do, that the sole end of the first act of breathing is to draw into the lungs oxygen gas without which the blood is not only dead itself, but a source of death to the whole animal kingdom, even to those which live under the ground and in the water, we see at a glance, swift and sure as that of lightning, that there is no separate and distinct nerve force, but that there is only one principle to perform all vital action, not only in the nerves, but in all the other systems and tissues of the body, and that that force is the oxygen of the outer air which is a gaseous ocean surrounding the planet to a height which has been variously stated by meteorologists as from twelve to sixty English miles, drawn into the lungs, absorbed there by the blood, every drop of which passes successively through these respiratory organs, impelled into every atom of the tissues by the heart, and in the invisible interstices of tissue (capillaries), where the vital processes are alone effected, and where the blood loses its oxygenated character, re-appearing as venous black or de-oxygenated blood, worse than useless till it has been again subjected to oxygenation in the lungs, changing into imponderable force, the spark or flame of life, and one with that

universal agent which we see in all inanimate things, as electricity, light, heat, and attraction according to the canons of the modern doctrine of correlation of physical force. Thus we reach *demonstrably* and with certainty, not only the same results as are *speculatively* and uncertainly and on data, upon which *pro* or *con.* men might reason for ever without coming to any positive conclusion, as those foreshadowed by such thinkers as Spinoza, Hegel, and others, but also those which Longfellow, with the unreasoning instinct of true poetic feeling and genius, has so tersely comprised in the couplets :

And the Poet, faithful and far seeing,
Feels alike in flowers and stars apart ;
 Of that self same universal being,
 That is throbbing in his brain and heart,—

or which Pope also in his “*Essay on Man*” thus expresses :

All are but parts of one stupendous whole,
 Whose body, Nature is, and God the soul,
 That changed through all, and still in all the same,
 Great in the earth as in the ethereal frame,
 Warms in the sun, refreshes in the breeze,
 Glows in the stars, and blossoms in the trees,
Lives through all life—extends through all extent,
 Spreads undivided, operates unspent,
 Breathes in our soul, informs our mortal part,
 As full, as perfect in a hair as heart ;
 To Him no high, no low, no great, no small,
 He fills, he bounds, connects, and equals all.

or which the Neo-Platonist, who penned the first verses of St. John’s Gospel, apparently confounding, with that radical defect of the Oriental mind to which I have alluded, in the opening sentences of this ontological exegesis, the impersonal formative force of the universe with a personal being, thus describes :—

“In the beginning was the word, and the word was with God, and the word was God. All things were made by Him, and without Him was not anything made that was made. In Him is Light, and the Light is the Life of Men.”

A whole flood of light illuminating the most obscure depths, not only of Theology and Metaphysics, but of the Science and Art of Medicine, also of Natural Philosophy and Chemistry, is thrown upon Human Nature and its relation to inorganic nature by the establishment of this simple principle that brain, muscle (the heart, &c.), and all organic tissues are vivified and perform their functions—the function, of course, differing

in each structure, though the cause of the function is the same one and indivisible entity in all—by electrical action which is only (according to the recently established doctrine of Correlation of Force) a differentiation of the universal inorganic one.

Before closing what I feel (considering the great extent and difficulty of the subject which would require not one treatise, but a whole series of treatises for its proper elaboration) cannot help being a very imperfect exposition, I ought to add that though the eminent men above mentioned, and many others, have advocated speculatively the electrical character of organic function; yet, as is only just and right considering the insufficient and inconclusive grounds of that advocacy, it has not yet received the sanction of scientific authority, and the doctrine is still proscribed in colleges and schools. Some of the best current authorities in biology ridicule the notion of the identity of nerve force and electricity, considering it as a wretched delusion, unworthy of scientific examination, and fit to take its place amid the delusions of pre-scientific times, with astrology, demonology, witchcraft, and ghost-seeing. Others again content themselves with adducing objections which *seem* fatal to the idea in the present state of science, though willing to allow that as science advances, all these objections which now *seem* insuperable, will vanish. The best *resumé* is in Dr. Hughes Bennett's exhaustive article "Physiology," in the last edition of the Encyclopedia Britannica, published a few years since by Adam and Charles Black, of Edinburgh. In this admirable treatise, Dr. Bennett, who is the present Professor of the Institutes of Medicine in the University of Edinburgh, with a rare felicity of generalisation and arrangement, succeeds in comprising under four very intelligible heads all the objections that have ever been raised by natural philosophers or physicians against the electrical theory of innervation, and yet is compelled to allow that the question is still a doubtful one, and liable at any moment to be reversed during the progress of discovery. The theory, indeed, has been constantly recurring ever since Franklin's consummately happy and daring experiment at Philadelphia more than a century ago. Supposed often to have been refuted and consigned to the limbo of exploded controversies, its vitality seems indestructible, and no sooner was it laid in the grave than its resurrection again sounded. And no wonder, the deep sympathy, even the coarsest and most apathetic, feel at times with nature, the extraordinary effect

produced on animal and vegetable life by electricity, the solemn awe inspired by thunder and lightning which the universal instinct of man typifies, along with the internal monitor of conscience, as the voice of the Almighty, and above all in the province of real objective science, *the identity of the symptoms and sensations, those of a benumbing and tingling kind which we vulgarly term "sleeping," produced in a limb or other part of the body by direct pressure, either on a nerve or on the arterial blood vessel that supplies it with vital fluid, with those of a properly graduated current from an electrical battery or galvanic pile,* all point to a hidden relationship—to a virtual identity—between the two forces, vital and physical. It will also be found on reflection that all the objections adduced by physicists and physicians apply only to that partial view of the subject, which limits the identity of the forces to the nervous system. If, as according to my view of the subject, we are not only justified, but compelled to deny the existence of a special nerve force, and to include all organic force under one category, viz., oxygen gas, whose origin is the atmosphere penetrating into the lungs, mixing there with the blood, and being conducted thence by means of the heart and arteries to every atom of the animal economy, all objections will be found to become a dead letter.

The position, in short, which I set out by asserting, *the Identity of Thought and its Objects*, seems triumphantly established. If I be right, it follows, though it would entail extending these remarks to too great a length to treat of the reasons at this time, that a new view must be taken of the internal composition of water, which, since the time of James Watt and Cavendish, has been considered to be a protoxide of hydrogen. I have always for many years past pressed upon chemists the necessity of re-considering current views of the constitution of this great element, which I have, since the close of my researches on the vagus nerve, always considered to be not a protoxide of hydrogen, but a liquefaction either of oxygen or hydrogen indifferently, oxygen being in my opinion electric fluid in its negative or static form, hydrogen, which is the lightest body in nature, and which, as determined by the Spectrum Analysis, plays a grand rôle in the fixed stars, being electric fluid in its more dynamic, active, or positive state—the vitreous and resinous electricities of Franklin. I have always been met by the impossibility of condensing either of these gases sufficiently so as to procure

them in their liquid form, as many other gases have been liquefied.

Dr. Tyndall has assured me that, at Vienna, according to some experiments published in "Poggendorff's Annalen," more than a dozen years ago, oxygen gas has been compressed with such tremendous power that its particles became so rigid as actually to shorten the steel pistons employed in its compression without the desired effect. But I always felt that there must be a better method than by mere mechanical pressure; and within the last few months (in the *London, Edinburgh, and Dublin Philosophical Magazine*, for August of the present year) a long paper appeared, filling, indeed, half the journal, by an electrician of repute, Mr. H. Wilde, of Manchester, in which, basing his results on a most exhaustive series of meteorological and chemical experiments, he reaches the same views as I did many years before from the phenomenon of nerve action when subjected alternately to oxygenated and de-oxygenated agency, and which he sums up by the formula that water is not a protoxide of hydrogen, but indifferently either oxygen or hydrogen reduced from a gaseous to a liquid condition, "oxygen and hydrogen being the same ponderable matter, separated into molecules of greater or less weight in a state of rapid motion, the lighter molecules (hydrogen) moving at a much greater velocity than the heavier molecules (oxygen), in order that equal volumes of these gases may produce equal pressures," which is just saying in other words, and giving a rationale for the fact, what I say about oxygen being electrical fluid or force in a less active condition than hydrogen.

Independently of these conclusions of Mr. Wilde and myself, arrived at by such widely different paths, the one operating with philosophical apparatus, the other grappling directly with the spirit (breath) of life in its material tenement, the same fact is indicated, though never realized, by many other phenomena in chemistry, which have been stumbling blocks in its path for the last fifty years. Oxygen, which is also vital air, gets its name because it was supposed to be the active agent in acid, (*Oxus* means sour in Greek) but of late years chemistry has had to give up this view, and to put hydrogen in its place, so that recent nomenclators say oxygen ought properly to be called hydrogen (water maker) and hydrogen, *basigen*. Many other phenomena I could mention inexplicable on any other hypothesis than that oxygen and hydrogen are transmutable, which means that they are the same things under a

different arrangement of their ultimate molecules, or, as chemistry now, for shortness, expresses it, in a different "allotropic" state.

I shall only mention one more most extraordinary instance, viz., the fact elicited by the researches of Faraday and Becquerel, that in every *drop* of water there is as much electricity as, when attenuated, goes to form a tremendous thunder clap, and which seems quite inexplicable on any other view of the question than that water and electricity (and as lying between them oxygen) are really the same fluids—the first in a highly condensed, the latter in a highly rarefied or ethereal state.

I think I have now said enough on the subject, the whole gist of which has no other object than to prove by such means as will alone satisfy the judgment of men in this age of judgment, what seems, without any science at all, so likely, that the Deity has, by one wave of matter, created both kingdoms of nature, the organic and inorganic. If it be so we get rid entirely of *all* religions. Christianity, in all its forms, Greek, Latin, or Protestant, must be content to take its place among those other organic productions of the human mind, not yet grown to its present stature, in which fancy and fable are confounded with fact. Its so-called "fundamental truths" seem to be palpable fallacies, and the pretensions claimed for its founder are clearly a mere confusion of a finite personal being with the impersonal formative agent in creation—animate and inanimate. The Messianic idea, in any shape, *must* be merely the vague sense the mystical, unscientific mind conceives of the progress of the universal mind of humanity, and the doctrine vulgarly termed the immortality of the soul, or individual sentient principle, is reduced to the *ideal* conception the cerebral function has of infinite duration in the future, precisely as the obsolete one of pre-existence springs from a sense of the infinite in the past. The apparently different ideas are really one and the same chimerical notion. Just as the Romans fabled of their founder—Romulus—that he was the son of a vestal virgin and a god, and of whose exceptional origin and infancy they told so many myths, making him the nursling of a wolf, and of whom they also fabled that he never knew death, but was carried up to Heaven in a storm of thunder and lightning, appearing after his translation in a glorified, transfigured form, promising to his people glory and prosperity—so do Christian creeds, evolved during ages of darkness and nescience, fable of *their* founder. Realise to ourselves the fact that one force alike governs mind, body, and the universal framework

of nature, and all that is not natural and reasonable is shown and felt experimentally to be illusion, having its source in the self-same confusion of personal feelings and external operations that, when we are giddy, makes the earth and the heavens appear to be turning round. When our nerves are out of order all things are out of order, for it is by our nerves and nervous structures that our thoughts, feelings, and five senses act, and derangement in them affects everything, and makes all the world appear to us disordered, when the disorder is only in ourselves. In all the sciences, in medicine, and political legislation, the establishment of this view would effect the same revolution of ideas as in theology and philosophy.

Rome, 25th Dec., 1868.

